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| 10/532,876 | 10/14/2005 | Hiroshi Yoshimine | 0230-0224PUS1 | 2285 |

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| EXAMINER | |
|---|---|
| ROSENAU, DEREK JOHN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2834 | |

| NOTIFICATION DATE | DELIVERY MODE |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/532,876 | YOSHIMINE ET AL. | |
| | Examiner | Art Unit | |
| | Derek J. Rosenau | 2834 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,5 and 9-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,9-12,14-19,21,23 and 24* is/are rejected.

7)☒ Claim(s) *13,20,22 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 5, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimne et al. (WO 02/47246) in view of Yoshiuchi et al. (US 6748807).

3. With respect to claim 1, Yoshimne et al. discloses a method for preventing signal coupling between two or more flow-through type chip-based mounted piezoelectric sensors (page 26, lines 7-20) used in an electrically conductive liquid (page 32, lines 1-7), wherein each of the sensors has a flowcell body (Fig 6) provided with its own resonator (item S) connected to its own single oscillator circuit (item 13) and its own single power supply (page 25, lines 15-19), said resonator being on a single substrate (item 1), comprising: making said flowcell body out of a non-conducting material (page 14, lines 20-22); providing each sensor with its own, individual conducting shield which substantially surrounds said flowcell body (page 26, lines 7-20), and making an inner wall of a flow tube and each cavity out of a non-conducting material (page 28, lines 9-14). While not explicitly stated, the inner wall of the cavity must be made of a non-conducting material; otherwise, a short circuit could form between the inner wall of the cavity and the sensor through the conducting fluid.

Yoshimne et al. does not disclose expressly that said conducting shield is connected to one pole of the power supply.

Yoshiuchi teaches a piezoelectric resonator sensor including a conducting shield (items 8 and 17), the conducting shield being connected to one pole, the grounding terminal, of the power supply (column 4, lines 2-5 and column 6, lines 4-7).

At the time of invention, it would have been obvious to combine the grounded shield of Yoshiuchi et al. with the piezoelectric sensor of Yoshimne et al. for the benefit of reducing the buildup of electrostatic charge in the conductive shield (column 6, lines 13-16).

4. With respect to claim 5, Yoshimne et al. discloses a piezoelectric resonator sensor (Fig 6) comprising: a flowcell body (Fig 6) comprising a resonator (item S) connected to a single oscillator circuit (item 13), wherein said flowcell body is made of a non-conducting material (page 14, lines 20-22); and a single power supply (page 25, lines 15-19) wherein said body is substantially surrounded by a conducting shield (page 26, lines 7-20), wherein an inner wall of a cavity, inlet channel and an outlet channel are insulated from said shield (page 28, lines 9-14). While not explicitly stated, the inner wall of the cavity must be made of a non-conducting material; otherwise, a short circuit could form between the inner wall of the cavity and the sensor through the conducting fluid. Therefore, the inner wall of the cavity would be insulated from the shield.

Yoshimne et al. does not disclose expressly that said conducting shield is connected to one pole of the power supply.

Yoshiuchi teaches a piezoelectric resonator sensor including a conducting shield (items 8 and 17), the conducting shield being connected to one pole, the ground terminal, of the power supply (column 4, lines 2-5 and column 6, lines 4-7).

At the time of invention, it would have been obvious to combine the grounded shield of Yoshiuchi et al. with the piezoelectric sensor of Yoshimne et al. for the benefit of reducing the buildup of electrostatic charge in the conductive shield (column 6, lines 13-16).

5. With respect to claim 18, the combination of Yoshimne et al. and Yoshiuchi et al. discloses the sensor in accordance with claim 5. Yoshiuchi et al. discloses that a flow tube (item 45) of said sensor is not shielded (Paragraph 83) by the conducting shield.

6. With respect to claim 19, Yoshimne et al. discloses a method for preventing signal coupling between two or more flow-through type chip-based mounted piezoelectric resonator sensors (page 26, lines 7-20) uses in an electrically conductive liquid (page 32, lines 1-7), wherein each of the sensors has a flowcell body (Fig 6) provided with it own resonator (item S) connected to its own single oscillator circuit (item 13) and its own power supply (page 25, lines 15-19), said resonator being on a single substrate (item 1), comprising: making an inner wall of a flow tube and each cavity out of a non-conducting material. As above, the inner walls of the flow tubes and cavities must be non-conducting in order to prevent the occurrence of short circuits.

Yoshimne et al. does not disclose expressly providing each sensor with its own, individual conducting shield which substantially surrounds said flowcell body, said conducting shield being connected to one pole of the power supply, wherein the poles

connected to said individual conducting shields of said sensors have the same polarity in said single power supplies.

Yoshiuchi teaches a piezoelectric resonator providing each sensor with its own, individual conducting shield (item 8 and 17) which substantially surrounds said flowcell body (Figs 13 and 14), said conducting shield being connected to one pole of the power supply (column 4, lines 2-5 and column 6, lines 4-7), wherein the poles connected to said individual conducting shields of said sensors have the same polarity in said single power supplies (each of the conducting shields is connected to the ground terminal of its power supply).

At the time of invention, it would have been obvious to combine the grounded shield of Yoshiuchi et al. with the piezoelectric sensor of Yoshimne et al. for the benefit of reducing the buildup of electrostatic charge in the conductive shield (column 6, lines 13-16).

7. Claims 9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimne et al. in view of Yoshiuchi et al. and Drum. (US 6384337).

8. With respect to claims 9 and 14, the combination of Yoshimne et al. and Yoshiuchi et al. discloses the inventions in accordance with claims 1 and 5, respectively.

Neither Yoshimne et al. nor Yoshiuchi et al. disclose expressly that said conducting shield is made of metal tape.

Drum teaches a device in which a conductive shield is formed using a metal tape (column 4, lines 17-48).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the metal tape of Drum with the device of Yoshimne et al. as modified by Yoshiuchi et al. for the benefit of ensuring total coverage of the desired area (column 4, lines 17-48).

9. Claims 10, 12, 15, 17, 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimne et al. in view of Yoshiuchi et al. and Ingram et al. (US 6815872).

10. With respect to claims 10 and 15, the combination of Yoshimne et al. and Yoshiuchi et al. discloses the inventions of claims 1 and 5 respectively. The combination of Yoshimne et al. and Yoshiuchi et al. also discloses a conductive shield (items 8 and 17) coated on the flowcell body, or housing (item 8), which must be made of a non-conducting material to avoid short circuits.

Neither Yoshimne et al nor Yoshiuchi et al. discloses expressly that an individual sensor housing for each sensor is made of plastic, and the plastic is coated with said individual conducting shield.

Ingram et al. teaches a piezoelectric sensor device in which the housing (item 40) is made of a plastic material (column 3, lines 15-21). In combination with Yoshimne et al. and Yoshiuchi et al., this would result in the flowcell body, or housing, of Yoshimne et al. being made of plastic, which in turn would be coated with the conducting shield of Yoshiuchi et al.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the plastic housing of Ingram et al. with the device of Yoshimne et

al. as modified by Yoshiuchi et al. for the benefit of making the housing impervious to water (column 3, lines 15-21 of Ingram et al.).

11. With respect to claims12 and 17, the combination of Yoshimne et al. and Yoshiuchi et al. discloses the inventions of claims 1 and 5 respectively. Yoshimne et al. discloses an oscillator circuit cavity for said each sensor (Fig 6).

Neither Yoshimne et al. nor Yoshiuchi et al. discloses expressly that the oscillator cavity for said each sensor is shielded by applying shielding material to interior walls of said cavity.

Ingram et al. teaches a piezoelectric sensor device in which an oscillator cavity (item 47) for the sensor is shielded by applying shielding material (item 50) to interior walls of said cavity (Fig 2).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the interior shield of Ingram et al. with the device of Yoshimne et al. as modified by Yoshiuchi et al. for the benefit of providing additional protection from external interference (column 2, lines 45-46 of Ingram et al.).

12. With respect to claim 21, the claim limitations therein are merely the combination of the claims elements of claims 1, 12, and 19; therefore, claim 21 is unpatentable over Yoshimne et al. in view of Yoshiuchi et al. and Ingram et al. for the same reasons as in claims 1, 12, and 19 above.

13. With respect to claim 23, the claim limitations therein are merely the combination of the claims elements of claims 5 and 17; therefore, claim 23 is unpatentable over

Yoshimne et al. in view of Yoshiuchi et al. and Ingram et al. for the same reasons as in claims 5 and 17 above.

14. With respect to claim 24, the combination of Yoshimne et al., Yoshiuchi et al., and Ingram et al. discloses the sensor in accordance with claim 23. Yoshiuchi et al. discloses that a flow tube (item 45) of said sensor is not shielded (Paragraph 83) by the conducting shield.

15. Claims 11 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimne et al. in view of Yoshiuchi et al. and Bellavance et al. (US 5421080).

16. With respect to claims 11 and 16, the combination of Yoshimne et al. and Yoshiuchi discloses the inventions of claims 1 and 5 respectively. Yoshiuchi et al. discloses applying the conducting material on an outer surface of the housing,

Neither Yoshimne et al. nor Yoshiuchi et al. discloses expressly that the individual conductive shield is made by spraying the conducting material on the housing.

Bellavance et al. teaches a device in which a conducting shield is formed by applying the conductive material with spraying (column 11, line 65 through column 12, line 8).

At the time of invention, it would have been obvious to a person of ordinary skill in the art o combine the spraying of Bellavance et al. with the device of Yoshimne et al. as modified by Yoshiuchi et al. for the benefit of using well-known fabrication techniques.

### *Allowable Subject Matter*

17. Claims 13, 20, 22, and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter. The prior art does not disclose or suggest "each flow tube interconnecting adjacent sensors is not shielded" in combination with the remaining claim elements of claims 13, 20, and 25. The prior art does not disclose or suggest "interconnecting adjacent sensors using a flow tube, wherein said flow tube is not shielded" in combination with the remaining claim elements of claim 22. Yoshimne et al. does not disclose interconnecting the plurality of sensors; therefore, Yoshimne et al. cannot disclose that the flow tubes interconnecting the sensors are not shielded.

### *Response to Arguments*

19. Applicant's arguments filed 20 August 2007 have been fully considered but they are not persuasive. Applicant argues that neither Yoshimne et al. nor Yoshiuchi et al. teaches a non-conductive flowcell body. However, Yoshimne discloses that the substrate (item 1) is non-conducting, where the substrate is part of the flowcell body. Additionally, the flowcell body (item 8) must be non-conducting in order to prevent the occurrence of short circuits through the conducting liquid to the flowcell body. Applicant argues that neither Yoshimne et al. nor Yoshiuchi et al. discloses poles connected to individual conducting shields of sensors have the same polarity in the single power supplies, as Yoshiuchi does not discuss how multiple individual conducting shields are

connected to power supplies. However, Yoshiuchi discloses that each of the shield electrodes is connected to ground, which is one of the poles of the power supply. The remainder of the arguments relate to subject matter that was not claimed previously, and for which new grounds of rejection have been introduced.

***Conclusion***

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is 571-272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek J Rosenau
Examiner
Art Unit 2834

DJR
9/25/2007

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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800